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| 10/757,842 | 01/15/2004 | Torsten Niederdraenk | P03,0605 | 5088 |

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| EXAMINER | |
|---|---|
| BRINEY III, WALTER F | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2615 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/757,842 | NIEDERDRAENK, TORSTEN | |
| | Examiner | Art Unit | |
| | Walter F. Briney III | 2615 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *15 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11 and 12* is/are rejected.

7)☒ Claim(s) *10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/10/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

**Claim 11** recites in lines 6-9 of the claim "the signal processing unit being configured to utilize the omnidirectional microphone signal to generate an output signal of the directional microphone corresponding to a directional characteristic." It is not clear how one microphone can generate the output of another. For the purposes of this office action, the above limitation is reinterpreted in light of paragraph [0025] of the invention to recite "the signal processing unit being configured to utilize the omnidirectional microphone signal and directional microphone signal to generate an output signal corresponding to a directional characteristic." Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1, 6 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshio et al. (Published Japanese Application 05-309943).**

**Claim 1** is limited to "a directional microphone." Yoshio discloses a variable directivity capacitor microphone as set forth in the Abstract thereof. Figure 1 depicts a cross section of the microphone. Openings 14a in diaphragm supporter materials 4a and 4b respectively correspond to "first and second sound entrance ports that are spatially separate from one another." Figures 1 and 3 depict a hollow 17a/b between the supporter material and the diaphragm 3a/b. See paragraph 17, lines 4-8. These hollows correspond to "first and second air volumes." Any one of air volumes 24-28 can be taken to correspond to the "third air volume" as recited. Diaphragms 3a and 3b respectively correspond to "first and second membranes." Figure 1 clearly indicates that the membranes are coupled to the sound entrance ports by the first and second air volumes as recited. Further, figure 1 indicates the coupling of the first and second membrane by each and every volume 24-28 as recited. Fixed poles, i.e. electrodes, 6a and 6b form an "output signal generator" in response to the changing capacitance between each electrode and diaphragms 3a and 3b. Therefore, Yoshio anticipates all limitations of the claim.

**Claim 6** is limited in part to "the directional microphone according to claim 1," as covered by Yoshio. Diaphragms 3a and 3b, which correspond to the first and second membranes, are clearly in parallel. Therefore, Yoshio anticipates all limitations of the claim.

**Claim 12** is limited to "a method for utilizing a hearing aid device." The method of claim 12 results inherently from using the microphone of Yoshio. Therefore, Yoshio anticipates all limitations of the claim.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**3. Claims 2-5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshio in view of Schneiter et al. (US Patent 4,504,703).**

**Claim 2** is limited in part to "the directional microphone according to claim 1," as covered by Yoshio. Although it is clear that the diaphragms 3 disclosed by Yoshio are inherently electrically conductive to enable energy conversion, it is not inherent that either diaphragm has a conductive layer on it, rather the diaphragms themselves may consist of a single layer of electrically conductive material. However, this deficiency is overcome by an obvious modification.

In particular, it is initially noted that Yoshio fails to disclose the appropriate materials of each diaphragm 3a and 3b. It is then incumbent on one of ordinary skill in the microphone art to select an appropriate electrically conductive diaphragm configuration for use in practicing the invention of Yoshio. Schneiter discloses an electro-acoustic transducer that provides an example of a capacitive microphone. A

diaphragm 17 is provided with an electret layer 25. Pressure on the diaphragm causes vibrations that change the potential between the electret layer 25 and a fixed electrode 16. See column 3, line 43, through column 4, line 68.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a diaphragm with an electret layer as taught by Schneiter because it is an established way to implement a capacitive microphone like that of Yoshio and because Yoshio fails to suggest the materials appropriate for the disclosed diaphragm.

**Claim 3** is limited in part to "the directional microphone according to claim 2," as covered by Yoshio in view of Schneiter. Either fixed pole 6a or 6b corresponds to "a backplate electrode at the electrically conductive layer." Therefore, Yoshio in view of Schneiter makes obvious all limitations of the claim.

**Claim 4** is limited in part to "the directional microphone according to claim 3," as covered by Yoshio in view of Schneiter. The conductive diaphragms 3a and 3b inherently form capacitors in conjunction with the electrodes 6a and 6b. Therefore, Yoshio in view of Schneiter makes obvious all limitations of the claim.

**Claim 5** is limited in part to "the directional microphone according to claim 3," as covered by Yoshio in view of Schneiter. As shown apropos the rejection of claim 2, each diaphragm 3a and 3b is inherently conductive, and it would have been obvious to coat them in such a way as recited. The conductive diaphragms 3a and 3b inherently form capacitors in conjunction with the electrodes 6a and 6b. Therefore, Yoshio in view of Schneiter makes obvious all limitations of the claim.

**Claim 7** is limited in part to "the directional microphone according to claim 3," as covered by Yoshio in view of Schneiter. The backplate electrode 6a is between both the first membrane 3a and second membrane 3b. There is "an air gap" between electrode 6a and second membrane 3b. Therefore, Yoshio in view of Schneiter makes obvious all limitations of the claim.

**Claim 8** is limited in part to "the directional microphone according to claim 3," as covered by Yoshio in view of Schneiter. Figure 5 of Yoshio clearly depicts "air ducts" 18 "for acoustic coupling." Therefore, Yoshio in view of Schneiter makes obvious all limitations of the claim.

**Claim 9** is limited in part to "the directional microphone according to claim 8," as covered by Yoshio in view of Schneiter. Figure 5 of Yoshio clearly depicts that "the air ducts" 18 are arranged in "parallel to one another" while figure 1 clearly depicts that the air ducts are arranged "perpendicular to the membranes." Therefore, Yoshio in view of Schneiter makes obvious all limitations of the claim.

**4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Killion et al. (US Patent 5,524,056) in view of Yoshio.**

**Claim 11** is limited to "a hearing aid system." Killion discloses a hearing aid having plural microphones and a microphone switching system. See Abstract. In the embodiment of figure 9, two microphones are provided, 20 and 15. Microphone 20 is at least a first-order directional microphone while microphone 15 is omnidirectional. See column 8, lines 16-20, and column 7, lines 19-25. In this way, both a "directional microphone" and an "omnidirectional microphone" are provided. The outputs of both

microphones are provided to a fader circuit including elements 150, 155 and 205. See column 8, lines 16-36. This fader circuit corresponds to a "signal processing unit connected to the directional microphone and the omnidirectional microphone." It is noted that the signal processor is configured to fade, i.e. mix, each microphone signal together to provide a certain directional response dependent on the amount of noise detected by logarithmic rectifier 215. This corresponds to "utilizing the omnidirectional microphone signal and directional microphone signal to generate an output signal corresponding to a directional characteristic." It is noted that Killion fails to disclose all aspects of the directional microphone according to claim 1, however. However, this deficiency is overcome by an obvious modification.

In particular, Killion simply fails to disclose a preferred directional microphone 20. In fact, Killion does not even identify any type of directional microphone. However, apropos the rejection of claim 1, it was shown that Yoshio teaches all aspects of the microphone recited in claim 1.

Therefore it would have been obvious to one of ordinary skill in the art to use the directional microphone as taught by Yoshio because it provides inexpensive variable directivity having a stable quality which obtains stable directivity and frequency response and because Killion fails to recognize any particular directional microphone to use.

***Allowable Subject Matter***

The following is a statement of reasons for the indication of allowable subject matter:

5. **Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

**Claim 10** is limited in part to "the directional microphone according to claim 1," as covered by Yoshio. None of the cited prior art provides a "small penetration opening for barometric pressure equalization." Thus, claim 10 is allowable over the cited prior art.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

WFB

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SUPERVISORY PATENT EXAMINER